

Amendment Dated May 5, 2005
Response to Office Action Dated 02/09/05

Application No. 10/786,697

REMARKS

Claims 1-25 are pending. Claims 1-25 are rejected.

The drawings are accepted by the Examiner. The Office Summary indicates that the specification is objected to by the Examiner. However, the Detailed Action does not discuss any objections to the specification. The Applicant requests clarification.

Claim Objections

Claims 13-17 and 22 are objected to because the numbering of individual features is inconsistent with the parent claim 12. The Applicant has amended claims 13-17 and 22 to have numbering that is consistent with the parent claim 12. The Applicant requests reconsideration of claims 13-17 and 22.

Cited Prior Art

The Office Action cites US Patent No. 5,506,910 (Miller) and US Patent No. 4,177,356 (Jaeger).

Miller discloses an automatic equalizer that sequentially adds subdued narrow band reference signals of different frequencies to an audio program signal and measures the magnitude of each successive broadcast reference signal to determine a measured frequency response of an audio frequency system and its environment. In particular, Miller discloses an audio system as shown in figures 3 and 5. As shown in figure 5, the audio system measures the frequency responses for the audio path from speaker 36a to audio sensor 40a (channel A) and for the audio path from speaker 36b to audio sensor 40b (channel B). The audio system (corresponding to automatic equalizers 20a and 20b) further equalizes the corresponding channels. Consequently, the frequency responses for channel A and channel B are altered to obtain desired frequency responses as shown in figure 2. Referring to figure 5, Miller discloses (Column 7, line: 41-50):

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A communication and control link 72 connects the automatic equalizers 20a and 20b for arbitrating and/or synchronizing the testing frequency generation and response analysis, either so that audio reference signals are generated either simultaneously or non-simultaneously in both channels. Simultaneous deep narrow notch filtering of the program signal to eliminate program frequencies in both channels A and B during adding of a narrow band reference frequency signal is also controlled through the link 72.

As disclosed above, Miller uses link 72 to synchronize automatic equalizers 20a and 20b to alter the frequency responses for audio path from speaker 36a to audio sensor 40a (channel A) and for the audio path from speaker 36b to audio sensor 40b. As shown in figure 1, Miller injects an audio reference signal at a desired frequency (as generated by sine wave adder 22) into recorded program material 30, in which recorded program material 30 is notched at the desired frequency by narrow band reject filter (notch filter) 21.

As shown in Figure 3, Miller also discloses feedback eliminator, which eliminates the acoustic feedback, which may occur for the paths between speakers 36a, 36b and microphones 28.

Jaeger discloses an expanding system for enhancing transmitted or recorded audio signals previously processed by anyone using different nonlinear amplifying techniques. The system is designed to divide the audio signal received into substantially discrete frequency bands and each band is separately expanded, independently of the other bands, so as to minimize "breathing" and "pumping". (Abstract.) Referring to figure 2, Jaeger discloses an improved expander system that can enhance a signal which may have been encoded, substantially independently of the nonlinear amplification technique employed prior to transmission or recording. (Column 5, lines 26-30.) The expander stereophonic system, as shown in figure 2, comprises separate control units 40A and 40B having the respective input terminals 44A and 44B for receiving the two stereophonic signals and a common level sensing or detection unit 42. (Column 5, lines 37-42.)

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Gain control modules (36A, 36B, and 36C) in both the left and right channels for expanding that portion of the information signal in a particular frequency band are controlled together with the same control voltage signal (corresponding to 36A, 36B, and 36C), thus preserving the stereo image or audio perspective. (Column 9, lines 53-58.)

Claim Rejections – 35 U.S.C. § 102

Claims 1-11 are rejected by the Office Action under 35 U.S.C. 102(b) as allegedly being anticipated by US 5,506,910 (Miller). However, Miller fails to teach or even suggest the element “a communications pathway between the first channel element and the second channel element, wherein one of the channel elements informs another channel element about detecting acoustic feedback, and wherein the other channel element may continue searching for an associated acoustic feedback component while said one of the channel elements configures in accordance with determined filter parameters” as claimed in claim 1. (Emphasis added.) The Office Action alleges that this element is disclosed in Miller (Col. 7, lines 42-47). However, Miller merely discloses (Column 7, lines 42-47. Emphasis added.):

A communication and control link 72 connects the automatic equalizers 10a and 20b for arbitrating and/or synchronizing the testing frequency generation and response analysis, either so that audio reference signals are generated either simultaneously or non-simultaneously in both channels.

Miller further discloses (Column 7, lines 51-55. Emphasis added.):

The stereo variation illustrates two channels with equalization, but any number of separate channels can be broadcast with equalization in each channel. Communication links between the multiple equalization units provide for the arbitration and/or synchronization of the testing frequency generation and response analysis.

Miller merely discloses the synchronization of stereo test signals. Miller fails to even suggest a communications pathway that informs another channel element about detecting acoustic

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feedback (i.e., between speakers 36a,36b and microphones 28) but merely informs the other channel element about audio reference signals that are acoustically transmitted over the path between speakers 36a,36b and audio sensors 40a,40b (as shown in figure 5 of Miller). Consequently, Miller fails to disclose stereo feedback detection, which is typically faster than mono feedback detection (as discussed in Paragraph 46 of the present patent application).

Claims 2-11 ultimately depend from claim 1 are not anticipated for at least the above reasons. Moreover, regarding claim 3, the claimed invention includes "a first adaptive notch filter that detects the first acoustic feedback component" and "a first operative notch filter that attenuates the first acoustic feedback component as instructed by the first adaptive notch filter or the second channel element." (Emphasis added.) However, Miller merely discloses (Column 3, lines 32-38.):

As shown in FIG. 1, an automatic equalizer 20 in accordance with one embodiment of the invention includes a signal adder, such as a narrow band reject filter 21 and a masked sine wave adder 22, for sequentially or randomly adding narrow band reference frequency signals to an electrical program signal from an audio program signal source such as mixer/preamplifier 24.

Miller merely discloses a notch filter (i.e., narrow band reject filter 21) that notches a portion of the frequency spectrum so that an audio reference signal can be injected in the portion of the frequency spectrum. Narrow band reject filter 21 does not affect acoustic feedback. Claims 4, 5, 8, 9, 10, and 11 include similar features as claim 3. Claim 4 includes the feature of "wherein the second operative notch filter receives filter parameters from the first operative notch filter in response to the first adaptive notch filter detecting the first acoustic feedback component." Also, claim 5 includes the feature of "wherein the second operative notch filter receives filter parameters from the first operative notch filter in response to the first adaptive notch filter detecting the first acoustic feedback component." Claim 8 includes "an additional channel

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element that detects an additional acoustic feedback component of an additional acoustic signal, the additional channel element comprising an additional operative notch filter." Claim 9 includes the feature of "wherein configurations of the first operative notch filter, the second operative notch filter, and the additional operative notch filter are interactive with each other." Claim 10 includes the feature of "wherein the first operative notch filter and the second operative notch filter are interactive, and wherein the first operative notch filter and the other operative notch filter are not interactive." Claim 11 includes "at least one constituent notch filter comprising a first constituent notch filter, wherein the first constituent notch filter is characterized by a first notch frequency and a first notch depth, and wherein the first notch frequency and the first notch depth are configured by the control module in accordance with the filter parameters." The Applicant requests for reconsideration of claims 1-11.

Claim Rejections – 35 U.S.C. § 103

Claims 12-25 are rejected by the Office Action under 35 U.S.C. 103(a) as allegedly being unpatentable over Miller and US 4,177,356 (Jaeger). Regarding claim 12, the claimed invention includes the feature of "sending, by the first channel element, a **first indicator that is indicative of the first acoustic feedback component** to the second channel element." (Emphasis added.) As discussed above, in reference to link 72, Miller fails to teach or even suggest a first indicator that is indicative of the first acoustic feedback component. Moreover, as admitted by the Office Action, "Jaeger does not teach a feedback suppression system." Jaeger does not make up for the deficiencies of Miller. Because claims 13-25 ultimately depend from claim 12, claims 13-25 are patentable for at least the above reasons. The Applicant requests for reconsideration of claims 12-25.

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Conclusions

All objections and rejections have been addressed. Hence, it is respectfully submitted that the present application is in condition for allowance, and a notice to that effect is earnestly solicited.

Respectfully submitted,

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